

STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES
PACIFIC CASCADE REGION

BLUE JAY THINNING

ROAD PLAN

SECTION 29, 30, 32, 33, 34, 35, 36, TOWNSHIP 07 NORTH, RANGE 05 EAST, W.M.
SECTION 01, TOWNSHIP 06 NORTH, RANGE 04 EAST, W.M.
SKAMANIA COUNTY

YACOLT DISTRICT

AGREEMENT NO.: 30-076806

CONTRACT ADMINISTRATOR: Marc Ratcliff

DATE: 12/01/2004

STAFF ENGINEER: Colin Forsyth

DRAWN & COMPILED BY: Alicia Compton

SECTION 0 – SCOPE OF PROJECT

This project includes but is not limited to optional construction including:

- clearing;
- grubbing;
- right-of-way debris disposal;
- excavation and/or embankment to subgrade;
- landing construction;
- acquisition and installation of drainage structures;
- acquisition, manufacture, and application of rock;
- grass seeding.

This project also includes but is not limited to optional reconstruction including:

- brushing right-of-way;
- clearing existing excavation and embankment slopes;
- grubbing existing excavation and embankment slopes;
- right-of-way debris disposal;
- landing construction;
- constructing ditches;
- acquisition and installation of additional drainage structures;
- constructing additional turnouts;
- compaction of road surface;
- acquisition, manufacture, and application of rock;
- grass seeding.

This project also includes but is not limited to abandonment including:

- light abandonment.

SECTION 1 - GENERAL CLAUSES

1.1-1

Clauses in this plan apply to all construction, reconstruction, or abandonment including landings unless otherwise noted.

1.1-3

Construction or reconstruction of the following roads is not required. Roads used by the Purchaser shall be constructed or reconstructed on the State's location and in accordance with this Road Plan.

<u>Road</u>	<u>Stations</u>	<u>Type</u>
Spur A	0+68 to 6+26	Reconstruction
Spur A	6+26 to 7+82	Construction
Spur B	0+84 to 6+13	Reconstruction
Spur B	6+13 to 7+81	Construction
Spur C	0+00 to 3+44	Construction

1.1-4

If the Purchaser desires a road location or design change, a revised Road Plan shall be submitted to the State for consideration.

1.1-5

On this plan quantities are minimum acceptable values. Additional quantities required by the State because of hidden conditions or Purchaser's choice of construction season or techniques shall be at the Purchaser's expense. Hidden conditions include, but are not limited to: solid subsurface rock, subsurface springs, saturated ground, and unstable soil.

1.1-10

Abandonment of the following roads is required. All roads shall be abandoned in accordance with this Road Plan.

<u>Road</u>	<u>Stations</u>	<u>Type</u>
Spur A	0+68 to 7+82	Light Abandonment
Spur B	0+84 to 7+81	Light Abandonment
Spur C	0+00 to 3+44	Light Abandonment

1.2-1

The construction or reconstruction of any roads specified herein shall not be permitted between November 15 and August 31 unless authority to do so is granted, in writing, by the Contract Administrator.

1.2-2

Purchaser shall not use roads constructed or reconstructed or pre-haul maintained under this Road Plan for hauling, other than timber cut on the right-of-way, without written approval from the Contract Administrator.

1.2-6

Pioneering shall not extend past construction that will be completed during the current construction season. Drainage shall be provided on all uncompleted construction as approved, in writing, by the Contract Administrator.

Clearing and grubbing shall be completed prior to starting excavation and embankment.

Culverts shall be installed in completed subgrade as construction progresses.

Subgrade, ditches, and culvert installations shall be completed and are subject to written approval by the Contract Administrator prior to rock application, subgrade compaction and/or timber haul.

1.4-3

Reference points (R.P.'s) that are moved or damaged at any time during construction shall be reset in their original locations by the Purchaser. Excavation and embankment shall not proceed on road segments controlled by said R.P.'s until all moved or damaged R.P.'s are reset.

1.5-1

Maintenance on roads listed in Contract Clauses C-50 (Purchaser Road Maintenance and Repair) and C-60 (Designated Road Maintainer) shall be performed in accordance with Forest Access Road Maintenance Specifications.

1.5-3

Snowplowing will be permitted only after execution of a "Snow Plowing Agreement", which is available from the Contract Administrator upon request.

SECTION 2 - CLEARING

2.1-1

Fell all vegetative material larger than 6 inches DBH or over 12 feet high between the marked right-of-way boundaries or if not marked in the field, between clearing limits specified on TYPICAL SECTION SHEET.

2.1-2

Deck all merchantable right-of-way timber. The decks shall be parallel to the road centerline and within the cleared right-of-way. The decks shall be free of dirt, limbs and other right-of-way debris, and removable by standard log loading equipment from the road bed.

SECTION 3 - GRUBBING

3-1

All stumps shall be removed that fall between grubbing limits shown on the TYPICAL SECTION SHEET. Those outside the grubbing limits but with undercut roots shall also be removed. Stumps over 22 inches diameter shall be split. Stumps over 40 inches shall be quartered.

3-2

Grubbing limits are defined as the entire area between the external limits shown on the TYPICAL SECTION SHEET.

SECTION 4 - DEBRIS DISPOSAL AND REMOVAL

4.1-1

Right-of-way debris is defined as all nonmerchantable vegetative material larger than one cubic foot in volume within the grubbing limits.

4.1-2

All right-of-way debris disposal shall be completed prior to the application of rock and/or timber haul.

4.2.3-1

Right-of-way debris shall be scattered outside the grubbing limits.

4.2.3-2

Right-of-way debris shall not be placed against standing timber.

SECTION 5 - EXCAVATION

5.1-1

Unless controlled by construction stakes or specific design sheets herein, roads shall be constructed or reconstructed in accordance with dimensions shown on the TYPICAL SECTION SHEET.

5.1-2

Purchaser shall not bury merchantable material.

5.1-3

Road grade and alignment shall conform to the State's marked location. Grade and alignment shall have smooth continuity without abrupt changes in direction. Maximum grades are: 18 percent favorable and 12 percent adverse. Minimum radius curve is 60 feet.

5.1-7

Roads shall be constructed or reconstructed to the dimensions shown on the TYPICAL SECTION SHEET, within the tolerance listed below. Tolerance classes for each road are listed on the TYPICAL SECTION SHEET.

<u>Tolerance Class</u>	<u>A</u>	<u>B</u>	<u>C</u>
Road Width (feet)	+1.5	+1.5	+2.0
Subgrade elevation (feet +/-)	0.5	1.0	2.0
Centerline alignment (feet lt./rt.)	1.0	1.5	3.0

5.1-8

Excavation slopes shall be constructed no steeper than shown on the following table:

<u>Material Type</u>	<u>Excavation Slope Ratio</u>
Common Earth (on side slopes of 55%)	1:1
Common Earth (55% to 70% sideslopes)	¾:1
Common Earth (on slopes over 70%)	½:1
Fractured or loose rock.....	½:1
Hardpan or solid rock.....	¼:1

5.1-9

Excavation and embankment slopes shall be constructed to a uniform line and left rough for easier revegetation.

5.1-11

Embankment slopes shall be constructed no steeper than shown on the following table:

<u>Material Type</u>	<u>Embankment Slope Ratio</u>
Common Earth and Rounded Gravel.....	1½:1
Angular Rock.....	1¼:1
Sandy Soils	2:1

5.1-12

Organic material shall be excluded from embankment and from waste material deposited on slopes in excess of 40 percent.

5.1-14

Where side slopes exceed 45 percent, full bench construction shall be utilized for the entire subgrade width.

5.1-16

Turnout locations noted on this plan are approximate. Locations shall be adjusted to fit with final subgrade alignment and sight distances.

5.1-17

Turnouts shall be intervisible with a maximum of 1,000 feet between turnouts unless shown otherwise on drawings. Location shall be subject to written approval of the Contract Administrator.

5.1-20

Purchaser shall construct ditches and reconstruct excavation slopes to provide sufficient width for ditches and road surface. Excavated slopes shall be consistent with Clause 5.1-8. Excavated material shall be scattered outside the grubbing limits or pushed to designated waste areas.

5.1.1-1

Waste material shall not be deposited within 50 feet of a cross drain culvert installation.

5.1.1-2

Waste material shall not be deposited within 100 feet of a live stream.

5.1.1-3

Waste material may be deposited adjacent to the road prism on side slopes up to 45 percent if the waste material is compacted and more than 100 feet away from live streams. On side slopes of 45 percent or more, all excavation shall be end hauled or pushed to designated embankment sites.

5.1.1-5

When constructing landings, waste material and embankment shall not be placed on side slopes steeper than 45%.

5.1.1-8

The amount of material to be contained in a waste area shall be at the discretion of the Contract Administrator.

5.2-1

Road pioneering operations shall not undercut the final cut slope, deposit excavated material outside the grubbing clearing right-of-way limits, or restrict drainage.

5.3-1

All embankment and waste material shall be compacted. The minimum acceptable compaction is achieved by placing embankments in 2 foot or shallower lifts and routing excavation equipment over entire width of the lifts. Side hill embankments too narrow to accommodate excavation equipment may be placed by end-dumping or side casting until sufficiently wide to support the equipment.

5.4-1

Silt-bearing runoff shall not be permitted to go into streams.

5.4-2

Accomplish sediment removal through silt traps, silt fences, settling ponds, or other methods as approved, in writing, by the Contract Administrator.

5.4-3.1

On the following roads, Purchaser shall furnish and evenly spread the seed mixture listed below on all exposed soil inside the grubbing limits at a rate of 40 pounds per acre. The date of application is subject to approval by the Contract Administrator.

<u>Mixture Percent by Weight</u>	<u>Minimum Percent Germination</u>
50% Fescue, Red	90% Germination
25% Ryegrass, Perennial	90% Germination
15% Bentgrass	85% Germination
10% Clover, White and White Dutch (inoculated)	90% Germination

Weed seed shall not exceed 0.5% by weight.

Seed shall be furnished in standard containers on which the following shall be shown:

1. Common name of seed
2. Net weight
3. Percent of purity
4. Percentage of germination
5. Percentage of weed seed and inert material

Fertilizer shall be applied at the rate of 100 pounds per acre and shall consist of 16-16-16 or other approved balanced mix.

*Mixture of seed is by percent weight of the total quantity of the seed.

<u>Road</u>	<u>Stations</u>	<u>Seed Quantity (lbs)</u>
Spur A	0+68 to 7+82	30
Spur B	0+84 to 7+81	30
Spur C	0+00 to 3+44	14

5.5-5

Finished subgrade shall be crowned or outsloped as shown on the TYPICAL SECTION SHEET, and shall be uniform, firm, rut-free, and shaped to ensure surface runoff in an even, unconcentrated manner.

SECTION 6 - DRAINAGE

6.2.1-1

Purchaser shall furnish, install, and maintain galvanized culverts (AASHTO Specification No. M-36) or corrugated polyethylene pipe (AASHTO specification No. M-294 Type S) as designated on the CULVERT LIST. Culvert and flume lengths shall be varied to fit as-built conditions subject to written approval by the Contract Administrator.

6.2.1-6

Metal, concrete, or plastic culverts and bands removed from the road bed shall be removed from State land prior to termination of this contract.

- 6.2.2.1-1
Culvert, downspout, flume, and energy dissipator installation shall be in accordance with CULVERT AND DRAINAGE SPECIFICATION DETAIL and the National Corrugated Metal Pipe Association "Installation Manual for Corrugated Steel Drainage Structures" and the Corrugated Polyethylene Pipe Association "Recommended Installation Practices for Corrugated Polyethylene Pipe and Fittings."
- 6.2.2.3-1
Cross drains and surface culverts on road grades in excess of 3% shall be skewed at least 30 degrees from perpendicular to the road centerline, except that cross drain culverts at the low points of dips in roads shall not be skewed.
- 6.2.2.3-2
Cross drain culverts shall be installed at a slope steeper than the incoming ditch grade, but not less than 3% nor more than 10%.
- 6.2.2.5-1
Drainage structure outfalls shall not terminate directly on unprotected soil that will erode. Downspouts, flumes, and energy dissipators shall be installed to prevent erosion.
- 6.3-1
Ditches shall be constructed concurrently with construction of the subgrade. Ditches shall drain to culverts, ditchouts, and natural drainages.
- 6.4-1
Catch basins shall be constructed to resist erosion in accordance with CULVERT AND DRAINAGE SPECIFICATION DETAIL. Minimum dimensions: two feet wide and four feet long with backslopes consistent with Clause 5.1-8: Excavation Slopes.
- 6.5-1
Headwalls shall be constructed in accordance with CULVERT AND DRAINAGE SPECIFICATION DETAIL.
- 6.5-2
Embankment slopes adjacent to culvert inlets and outlets at live stream crossings shall be armored with machine placed light loose riprap for a distance of one culvert diameters on each side of the pipe and one culvert diameter above the pipe in accordance with the CULVERT LIST.

SECTION 7 - ROCK

- 7.1-1
Rock for construction and/or reconstruction under this contract may be obtained from pit on State land as listed below at no charge to the Purchaser. Development and use shall be in accordance with a written "Development Plan" prepared by the State. A copy of the written plan is available upon request from the Pacific Cascade Region office. Upon completion of operations, the rock source shall be left in the condition specified in said plan, subject to approval by the Contract Administrator. Use of material from any other source must have prior written approval from the Contract Administrator. If other operators are using or desire to use this rock source, a joint operating plan shall be developed. All parties shall follow these plans.
- | <u>Source</u> | <u>Location</u> |
|---------------|------------------------------------|
| S-6000 Pit | NW ¼ Sec 1, T06N R04E, W.M. |
| 17 Road Pit | NW ¼ SE ¼ Sec 34, T07N, R05E, W.M. |
- 7.1-2
Rock from other sources must be approved, in writing, by the Contract Administrator.
- 7.1-6
Rock for construction or reconstruction under this contract may be obtained from any commercial source as approved in writing by the Contract Administrator.

7.2.1.2-2

PIT RUN rock will meet the following specifications for gradation when placed on the subgrade:

No more than 10% of the rock shall be larger than 8 inches in any dimension, and no rock shall be larger than 12 inches in any dimension.

Pit run rock shall contain no more than 5 percent by weight of vegetative debris, dirt, or trash.

7.2.4-1

Rock drilling and shooting shall meet the following specifications:

- a. Oversize material remaining in the rock source at the conclusion of the timber sale shall not exceed 5 percent of the total volume mined for the sale.
- b. Oversize material is defined as rock fragments larger than two feet in any dimension.

7.4.2-1

Apply at least the minimum required rock quantity as shown on the ROCK LIST. Required and optional rock shall meet the specifications on the ROCK LIST.

7.4.2-5

Subgrade shall be approved, in writing, by the Contract Administrator prior to application of rock.

7.4.2-9

Turnarounds, turnouts, and curve widening shall have rock applied to the same depth and specifications as the traveled way.

7.4.2-10

Each lift of rock shall be crowned as shown on TYPICAL SECTION SHEET, and shall be uniform, firm, rut-free, and shaped to ensure surface runoff in an even, unconcentrated manner.

7.4.3-5

On all roads, compaction shall be by vibratory grid roller (Elliot grid meets this specification) weighing at least 20,000 pounds. At least three complete passes at a minimum speed of 5 mph shall be made prior to reshaping the surface.

SECTION 9 - ROAD AND LANDING DEACTIVATION

9.2-1

Purchaser shall reduce or relocate landing debris, in a manner approved, in writing, by the Contract Administrator, to avoid landing failures and potential debris slides.

SECTION 10 - ROAD AND LANDING ABANDONMENT

10.1-1

The following roads shall be abandoned by the Purchaser at the State property line at the termination of use within 30 days following completion of timber harvest removal prior to the termination of this contract and according to the ROAD ABANDONMENT CROSS SECTIONS DETAIL.

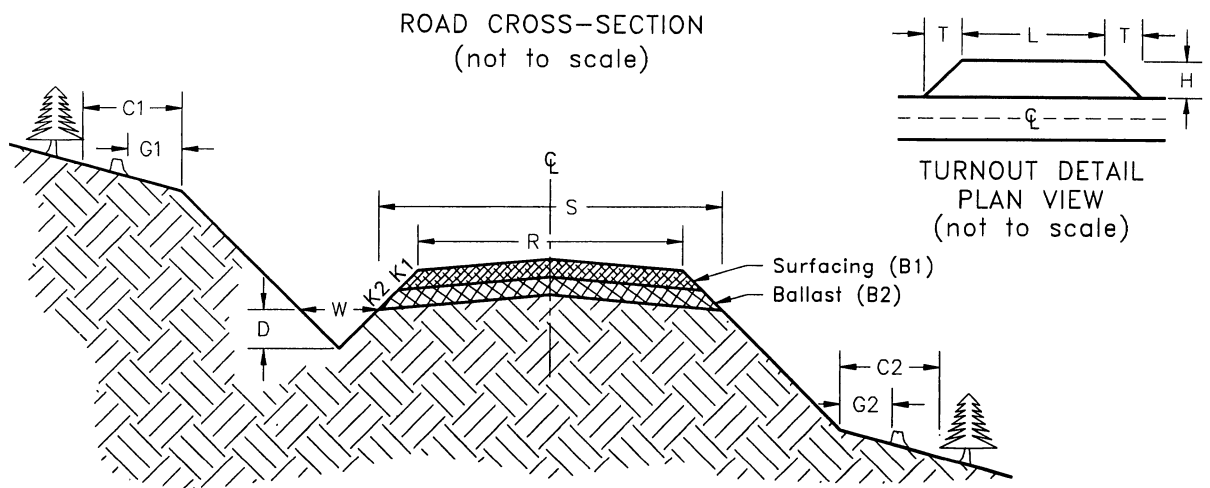
<u>Road</u>	<u>Stations</u>	<u>Type</u>
Spur A	0+68 to 7+82	Light
Spur B	0+84 to 7+81	Light
Spur C	0+00 to 3+44	Light

10.1-2

Light Abandonment shall consist of:

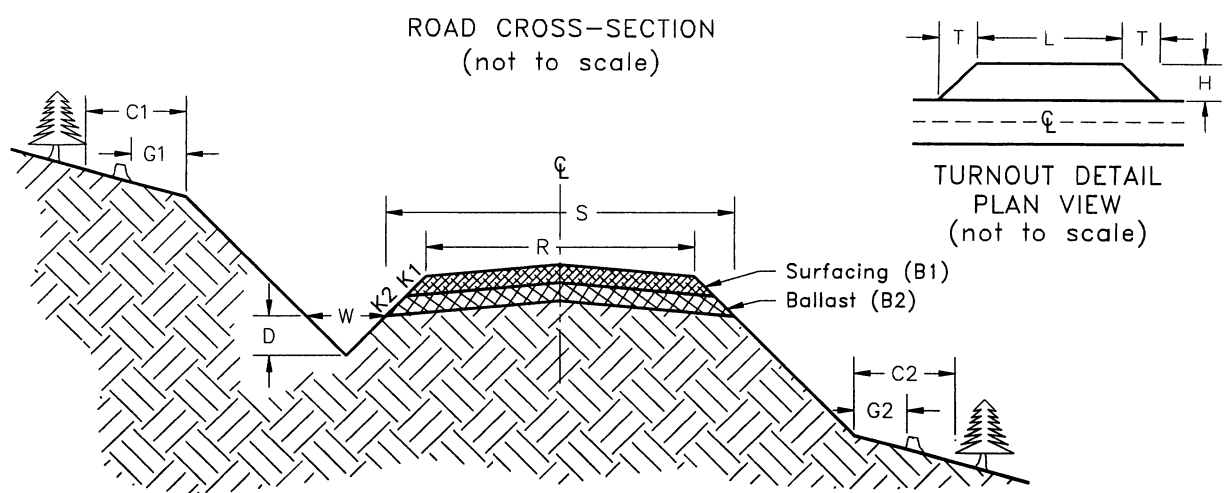
- constructing non-drivable water bars in conformance with the attached NON-DRIVABLE WATER BAR DETAIL at a maximum spacing which will produce a vertical drop of no more than 10 feet between water bars or between natural drainage paths and with a maximum spacing of 100 feet, or as marked in the field;
- skewing water bars at least 30 degrees from perpendicular to the road centerline on roads in excess of 3% grade;
- keying water bars into ditchline;
- construction of tank trap barriers in conformance with the attached "T" TANK TRAP DETAIL;
- removing culverts from State Land;
- removing ditch cross drain culverts and leaving the resulting trench open;
- sloping all trench walls and approach embankments no steeper than 1.5:1;
- grass seeding concurrently with abandonment and in accordance with Clause: 5.4-3.1;
- covering, concurrently with abandonment, all exposed soils within 100 feet of any live stream, with a 8 inch deep layer of straw.

TYPICAL SECTION SHEET



Road Number	From Station	To Station	Tolerance Class	Subgrade Width	Road Width	Ditch		Crown in. @ CL	Grubbing Limits		Clearing Limits	
				S	R	W	D		G1	G2	C1	C2
Spur A	0+68	7+82	C	15'	10'	--	--					
Spur B	0+84	6+14	C	15'	10'	3'	1'	4"				
Spur B	6+15	7+81	-	-	-	--	--	-	-	-	-	-
Spur C	0+00	3+44	C	15'	10'	3'	1'	4"				

ROCK LIST

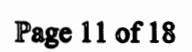


BALLAST

Road Number	From Station	To Station	Rock Slope	Compacted Rock Depth	C.Y./ Station	# of Stations	C.Y. Subtotal	Rock Source	Turnout		
									Length	Width	Taper
			K2	B2					L	H	T
Spur A	0+68	7+82	1 ½:1	12"	54	7.14	385	S-600/17RD	--	--	--
Spur B	0+84	7+81	1 ½:1	12"	54	6.97	376	S-600/17RD	25'	50'	25'
Spur C	0+00	3+44	1 ½:1	12"	54	3.44	186	S-600/17RD	--	--	--
Landing					60	5	300	S-600/17RD			
Turnout					54	1	54	S-600/17RD			

BALLAST TOTAL 1,301 Cubic Yards

ROAD PLAN MAP



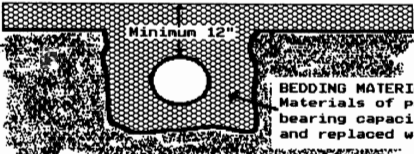
CULVERT LIST

Road Number	Location	Culvert		Length (ft)			Riprap (C.Y.)			Backfill Material	Placement Method	Const. Staked	Remarks
		Dia.	Gauge	Culvert	Downspt	Flume	Inlet	Outlet	Type				
			If Steel										
Spur B	0+84	18"	16	32	--	--	0.5	--	PR	NT	--	RP	

Key:

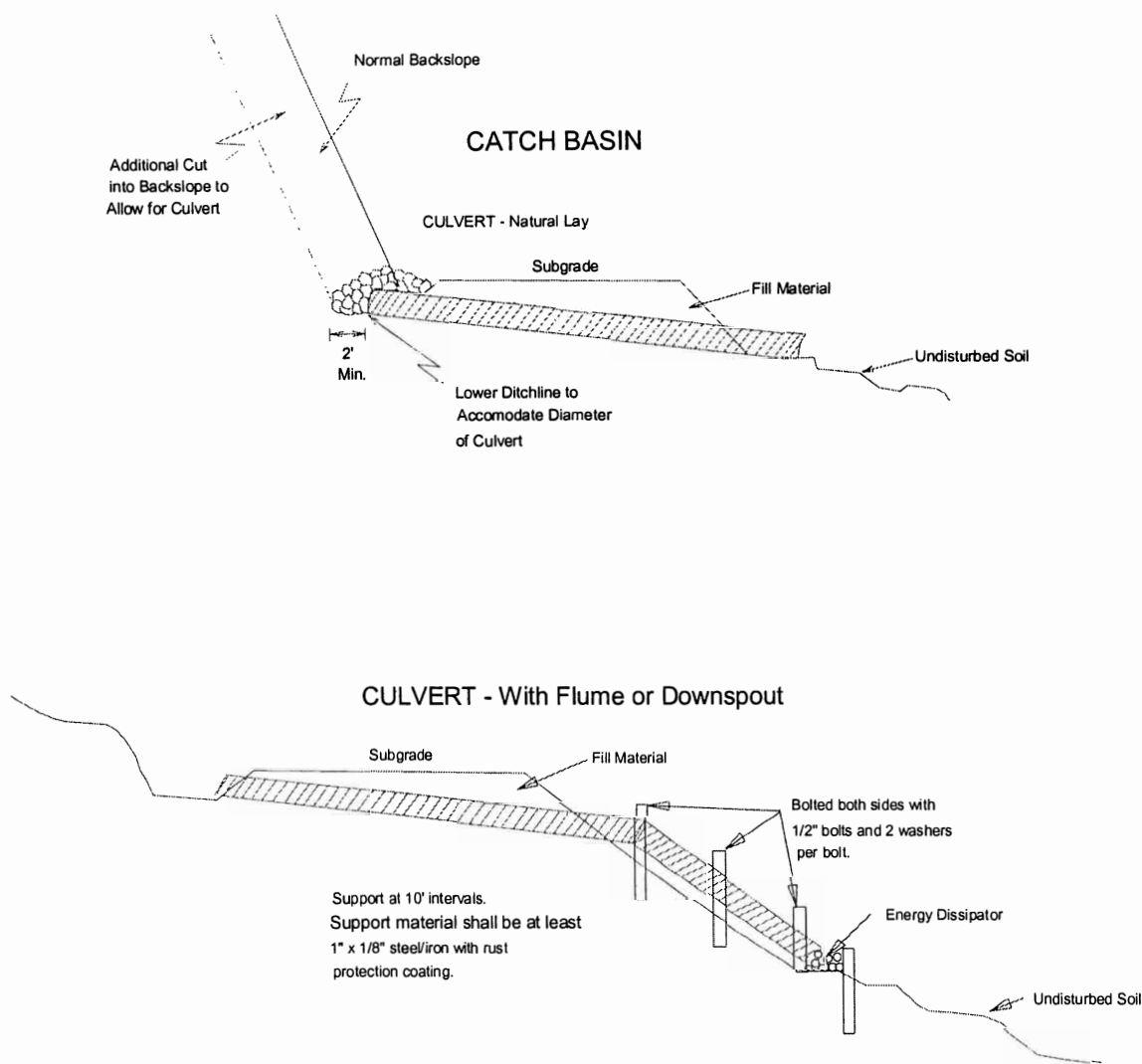
- PR - Pit Run rock
NT - Native (bank run)
SL - Select Fill
HL - Heavy Loose Riprap
LL - Light Loose Riprap
Flume - Half round pipe
Downspout - Full round pipe

CULVERT BACKFILL AND BASE PREPARATION
(For culverts less than 36")

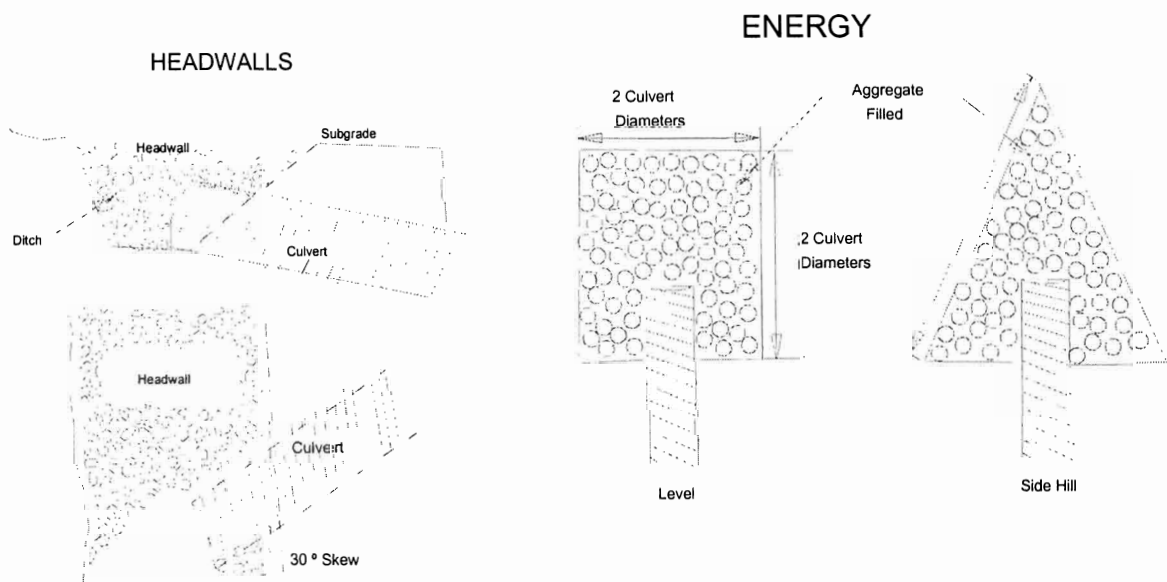


CULVERT AND DRAINAGE SPECIFICATION DETAIL

(Page 1 of 2)



Proper preparation of foundation and placement of bedding material shall precede the installation of all culvert pipe. This includes necessary leveling of the native trench bottom and compaction of required bedding material to form a uniform dense unyielding base. The backfill material shall be placed so that the pipe is uniformly supported along the barrel.



Headwalls to be constructed of material that will resist erosion.

Dissipator Specifications:
Depth: 1 culvert diameter
Aggregate: as specified in the CULVERT LIST.

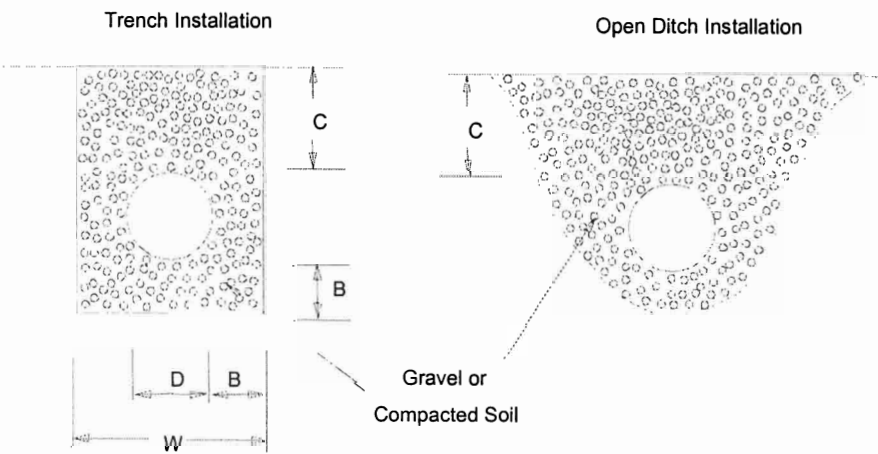
CULVERT AND DRAINAGE SPECIFICATION DETAIL

(Page 2 of 2)

POLYETHYLENE PIPE INSTALLATION

INSTALLATION REQUIREMENTS:

- 1. Crushed stone, gravel, or compacted soil backfill material shall be used as the bedding and envelope material around the culvert. The aggregate size shall not exceed 1/6 pipe diameter or 4" diameter, whichever is smaller.
- 2. The corrugated pipe shall be laid on grade, on a layer of bedding material as shown for the two types of installations. If native soil is used as the bedding and backfill material, it shall be well compacted in six inch layers under the haunches, around the sides and above the pipe to the recommended minimum height of cover.
- 3. Either crushed aggregate or flexible (asphalt) pavement may be laid as part of the minimum cover requirements.
- 4. Site conditions and availability of bedding materials often dictate the type of installation method used.
- 5. The load bearing capability of flexible conduits is dependent on the type of backfill material used and the degree of compaction achieved. Crushed stone and gravel backfill materials typically reach a compaction level of 90-95% AASHTO standard density without compaction. When native soils are used as backfill material, a compaction level of 85% is required. This minimum compaction can be achieved by either hand or mechanical tamping.



MINIMUM DIMENSIONS
Trench or Open Ditch Installation

Nominal Diameter	Minimum Thickness	Minimum Cover	Min. Trench Width
D	B	C	W
18"	6"	12"	36"
24"	6"	12"	42"
30"	6"	12"	48"
36"	6"	12"	54"

STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES

FOREST ACCESS ROAD
MAINTENANCE SPECIFICATIONS

1. CONSTRUCTION AND RECONSTRUCTION (Prior to acceptance to the contract or acceptance on a timber sale).

A. Cuts and Fills

1. Maintain slope lines as constructed. Remove slides from the ditches and roadway. Replace fills to 12:1 slopes with selected material or as directed. Remove overhanging material from the cut slopes.
2. Material from slides or other sources requiring removal shall not be deposited in streams or at locations where it will erode into streams or water courses.
3. Undesirable slide materials and debris shall not be mixed into the surface material.

B. Surface

1. Grade and shape the road surface, turnouts, and shoulders to the original crown, inslope or outslope as directed to provide suitable traveled surface and surface water runoff in an even, unconcentrated manner.
2. Blading must not undercut the backslope at the bottom of the ditchline or cut geotextile at centerline.
3. Watering may be required to control dust and to retain fine surface rock.
4. Desirable surface material shall not be bladed off the roadway.
5. Replace surface material lost or worn away.
6. Remove berms except as directed by the State.
7. Barrel spread soft spots to prevent degradation of geotextile.

C. Drainage

1. Keep ditches and drainage channels at outlets and inlets of culverts clear of obstructions and functioning as intended.
2. Inspect and clean culverts at least monthly, with additional inspections during storms and periods of high runoff. This must be done even during periods of inactivity.
3. Add stable material at the outlet end of the culvert as needed to stabilize the stream bed.
4. Headwalls: maintain to the road shoulder level with material that will resist erosion.
5. Keep silt bearing surface runoff from getting into live streams.

D. Structures

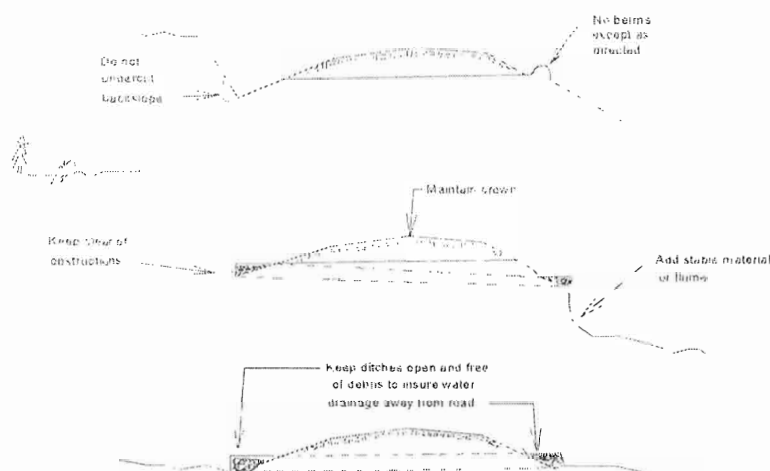
Repair bridges, culverts, cattleguards, fences, and other road structures to the condition required by the construction specifications.

E. Termination of Use or End of Season

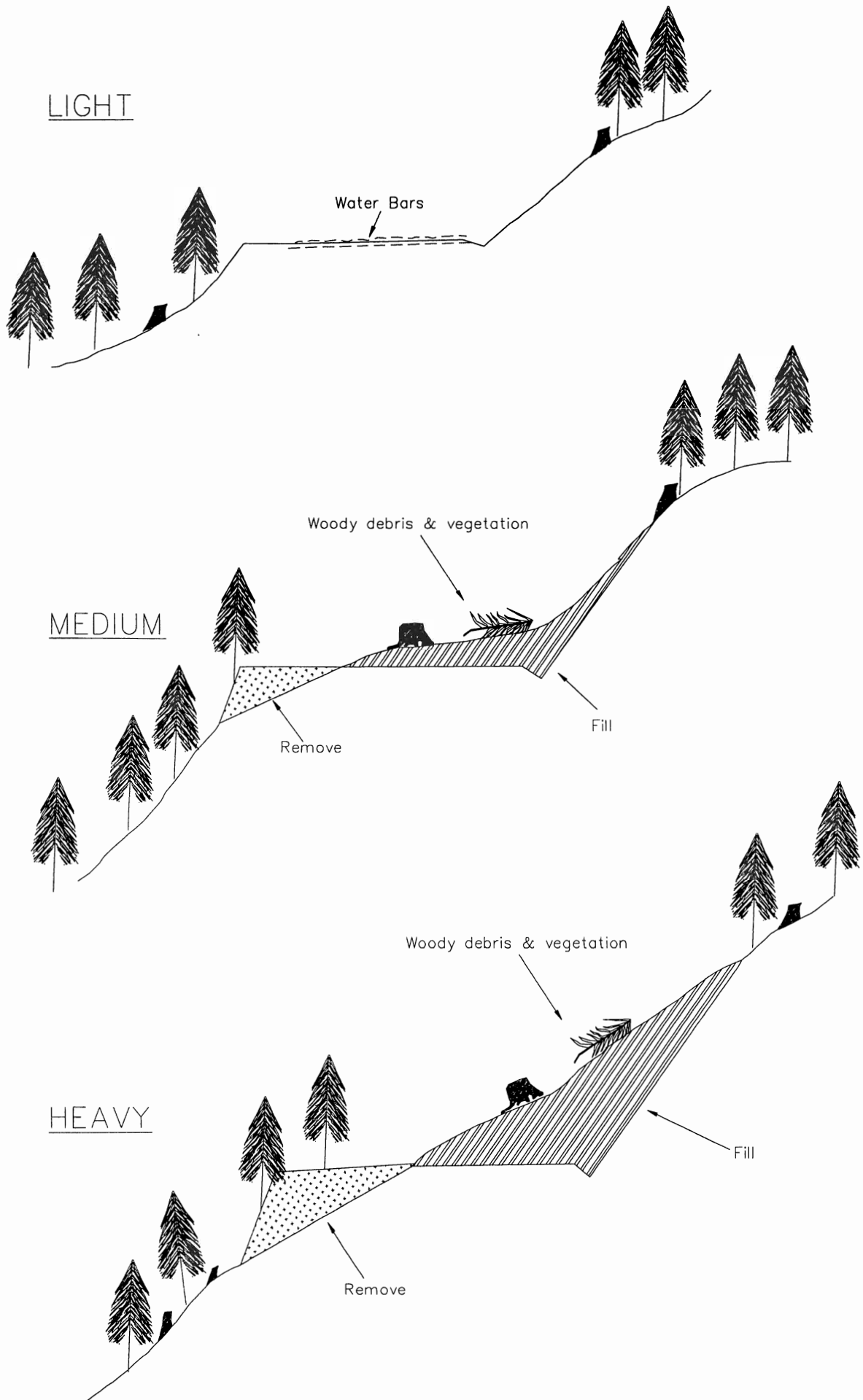
Do maintenance work to minimize damage from the elements such as blading to insure correct runoff, ditch, and culvert cleaning and water bars.

F. Debris

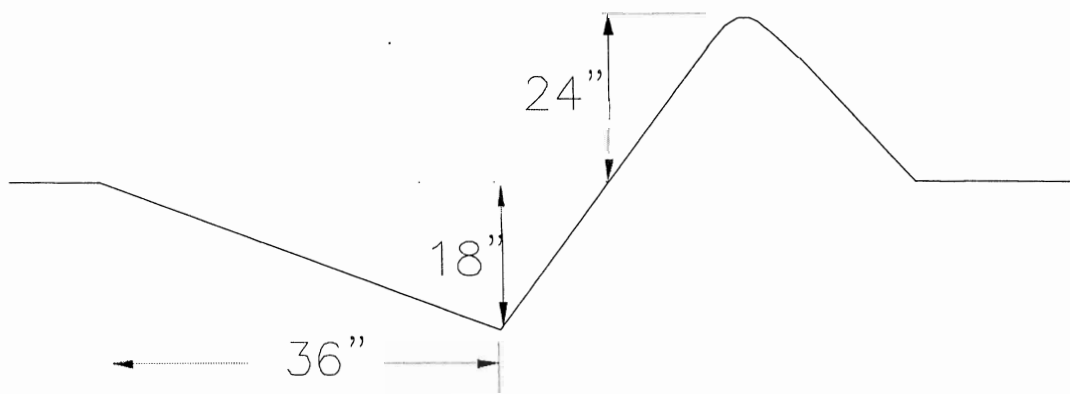
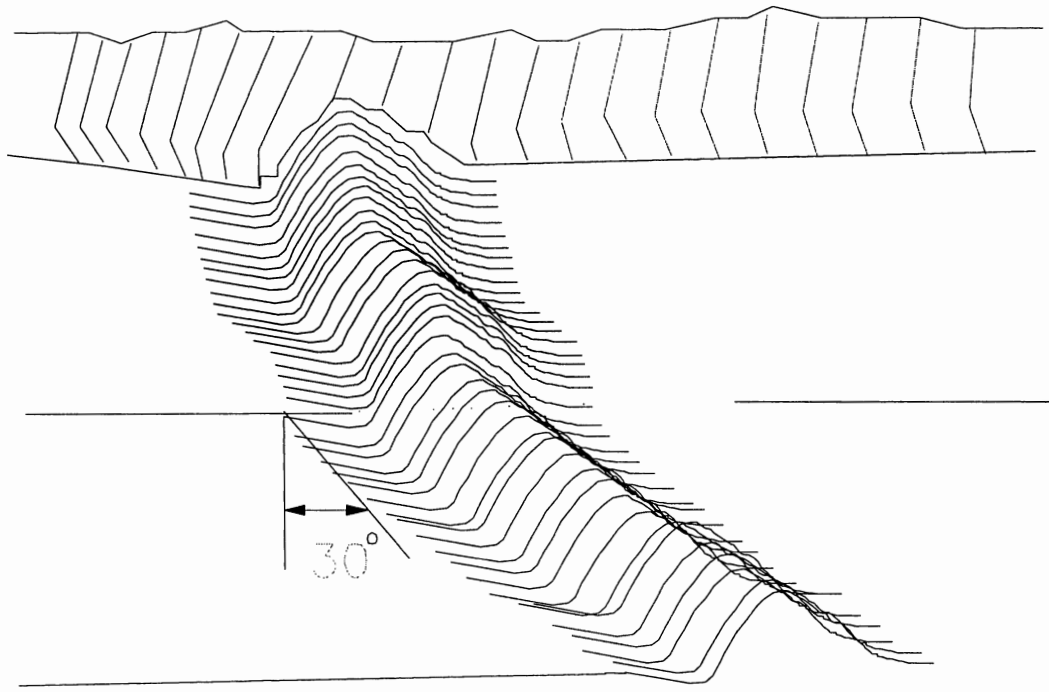
Remove fallen timber, limbs, and stumps from the slopes or roadway.



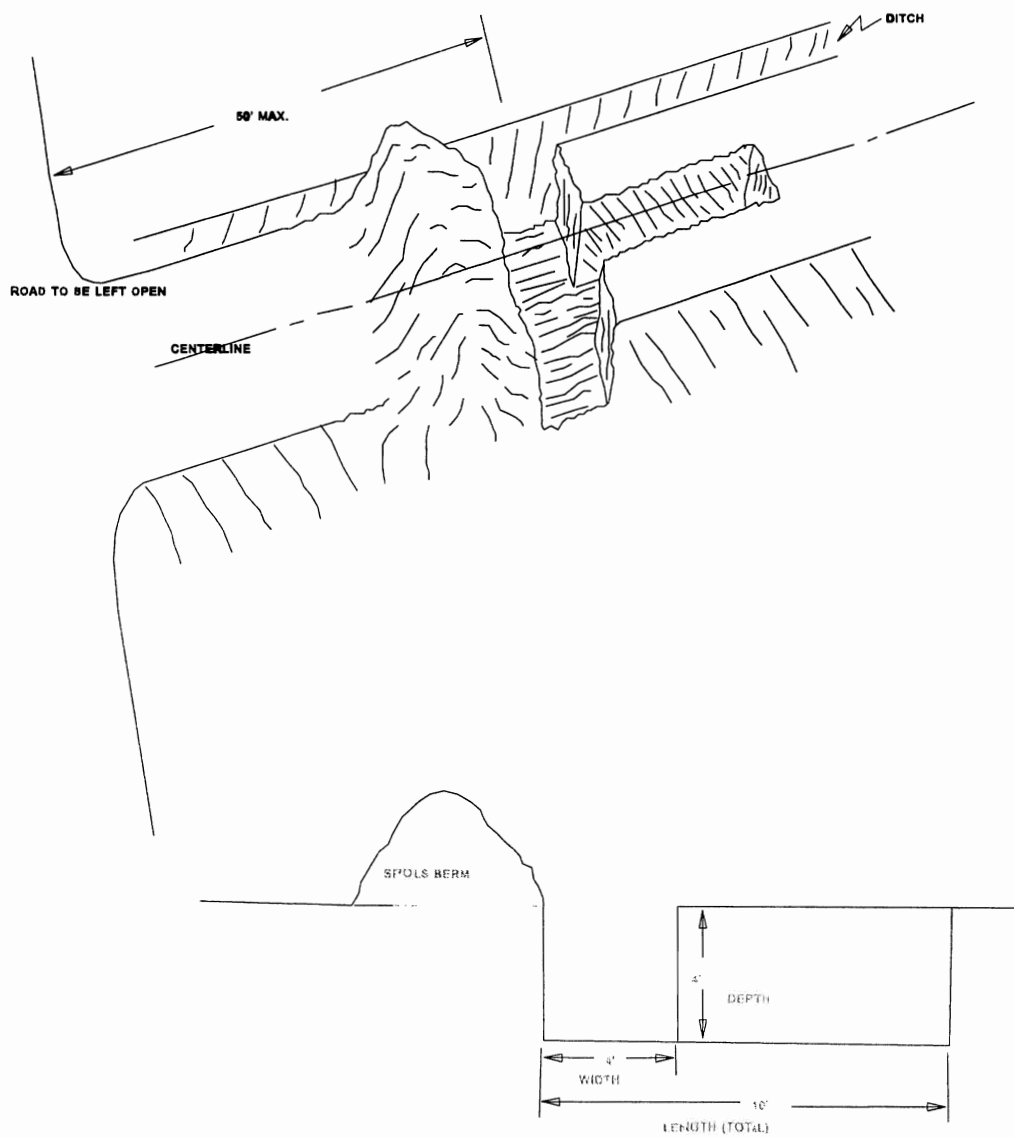
ROAD ABANDONMENT CROSS SECTIONS

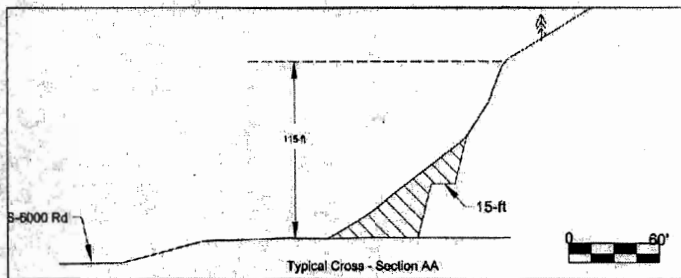


NON-DRIVABLE WATER BAR DETAIL



"T" TANK TRAP DETAIL





DEVELOPMENT

Overburden and debris shall be deposited in areas approved by the State Representative. Waste material should be compacted in layers less than 2 feet in depth.

Mining shall begin in Areas A and B. Development can continue into Area C as needed. No future development to exist. Stockpile in main pit floor or designated area.

Material shall be removed in such a manner so that no working face exceeds a height greater than 40 feet. Faces with heights over 30 feet shall be sloped at 1/4:1. If conditions are such that a bench removal is possible, pit material shall be removed where bench width shall be no smaller than 15 feet.

Minimum clearing distance from the pit edge shall be 75% of the height of the tallest tree. Contractor shall maintain a 15 foot wide stepped area from the pit face at all times.

Stockpiling operations shall be accomplished in the area as approved by the State Representative. All stock piled material shall be maintained in a neat and usable condition.

All operations must be carried out in compliance with Washington Department of Labor and Industries.

RECLAMATION

Reclamation will be achieved by properly removing materials as stated in the Development plan.

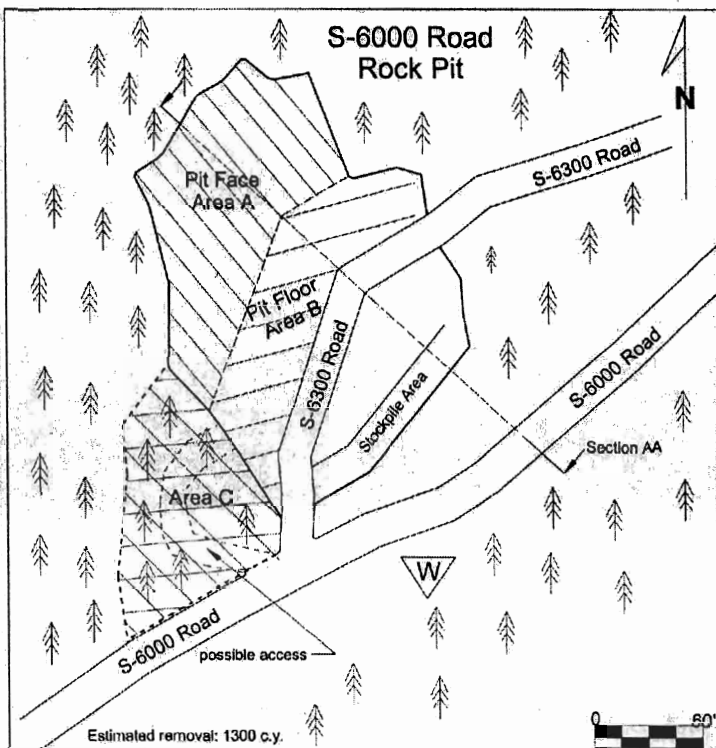
Upon completion of operations in the pit, the area will be left in a condition that will not endanger public safety, damage property, or be hazardous to animal or human life.

Pit floor shall be left in a smooth and neat condition, out-sloped a minimum of 2% to provide site drainage.

The pit area shall be worked and left in condition that future operations may proceed in an orderly manner.

Upon completion of operations, the site shall be cleared of all temporary structures, equipment and rubbish, and shall be left in a neat and presentable condition.

S-6000 Road Pit Plan
Blue Jay Thinning
NW 1/4 of Section 1,
T6N, R4E



SUMMARY - Road Development Costs

DISTRICT: Yacolt

SALE/PROJECT NAME: Blue Jay Thin

CONTRACT NUMBER: 30-076806

LEGAL DESCRIPTION: Sections 29-36 Township 7 North, Range 5 East W.M.

ROAD NUMBER:	0	0	Road A, Road B, Spur C
ROAD STANDARD:	Mainline (14' R.S.)	Secondary Mainline (12' R.S.)	Spur road (10' R.S.)
NUMBER OF STATIONS:	0.00	0.00	17.55
SIDESLOPE:	0	0	5-60%
CLEARING AND GRUBBING:	\$0	\$0	\$1,343
EXCAVATION AND FILL:	\$0	\$0	\$1,699
ROCK TOTALS (Cu. Yds.):			
Ballast: 948	\$0	\$0	\$6,375
Surface: 0	\$0	\$0	\$0
Riprap: 0	\$0	\$0	\$0
CULVERTS AND FLUMES:	\$0	\$0	\$388
STRUCTURES:	\$0	\$0	\$0
GENERAL EXPENSES:	\$0	\$0	\$1,078
MOBILIZATION:	\$0	\$0	\$1,690
TOTAL COSTS:	\$0	\$0	\$12,573
COST PER STATION:	#DIV/0!	#DIV/0!	\$716
NOTE: This appraisal has no allowance for profit and risk.		TOTAL (All Roads) =	\$12,573
		SALE VOLUME MBF =	879
		TOTAL COST PER MBF =	\$14.30
Plans to be furnished by:	Compiled by: Colin Forsyth	Date: 12/06/04	
Plan only: STATE	Checked by:	Date:	
Plan-profile:	Region Engineer:	Date:	
	Div of Engr.:	Date:	

REMARKS: _____

PACIFIC CASCADE REGION - ROAD COST ESTIMATE

SALE NAME: Blue Jay Thin

CONTRACT NUMBER: N/A

I. CLEARING AND GRUBBING:

Flat Rate -	% Side Slope	MBF/ac	Disposal Factor	Production Factor	Cost/ Station	Width Factor	Total Stations	Sub Total
0	30%	35	1.00	3.90	\$40	1.00	0.00	\$0
	40%	35	1.00	4.29	\$40	1.00	0.00	\$0
	50%	35	1.00	4.70	\$40	1.00	0.00	\$0
	60%	35	1.00	6.15	\$40	1.00	0.00	\$0

Clear and Grub TOTAL = \$0

II. EXCAVATION:

Flat Rate -	% Side Slope	Exc. Type Fact.	Production Factor	Cost/ Station	Width Factor	Total Stations	Sub Total
0	30%	1.00	2.50	\$88	1.00	0.00	\$0
	40%	1.00	4.56	\$88	1.00	0.00	\$0
	50%	1.00	6.85	\$88	1.00	0.00	\$0

Abandonment

*End Haul, Over Haul, Large Fills/Cuts

End Haul/ Over Haul
Large Fills/ Cuts

Estimated Vol. (cy)	No. of Equip. Days	Cost/day	Sub Total
5000	0	\$3,300	\$0
3000	0	\$3,300	\$0

Excavation TOTAL = \$0

III. BALLAST AND SURFACING :

Ballast source: 0
Surface source: Perry Creek Quarry
Riprap source : Perry Creek Quarry

Description	cu.yds/sta	x stations	= cubic yards
Ballast (4"-)	51	0.00	0
Surfacing (2 1/2"-)	30	0.00	0
Riprap			

* Haul Formula: (R.T.Miles/MPH+Delay)/(\$/hr / Cy/load)

R.T. Miles = 6.0
Ave. Speed = 25
Delay (Hrs.)= 0.2
Cost / Hour = \$77.00
CY / Load = 20

Ballast (4"-)
Surfacing (2 1/2"
Riprap

0 Cu. yds @
0 Cu. yds @
0 Cu. yds @

\$8.94 /cu. yd = \$0
\$9.69 /cu. yd = \$0
\$1.69 /cu. yd = \$0

UNIT COSTS	Ballast	Surfacing	Riprap
Drill & Shoot	\$2.50	\$2.50	
Dig and load	\$1.00	\$1.00	
Crushing	\$2.50	\$3.25	
Purchase			
Haul *	\$1.69	\$1.69	\$1.69
Spread	\$0.80	\$0.80	
Compact	\$0.45	\$0.45	
Strip			
Reclamation			
TOTAL (\$/cy)	\$8.94	\$9.69	\$1.69

Rock total = \$0

IV. CULVERTS AND FLUMES:

UMES:					Installed	
Description	Qty.	Gauge	Diameter (in.)	No/Length (ft)	Cost/ft	Sub-total
	0	na	18	36	\$11.80	\$0
	0	14	24	50	\$16.70	\$0
	0	14	36	50	\$25.30	\$0

Bands & Gaskets 44 - 18"@ \$9.90ea, 6 -24" @ \$13.20 ea., 1 - 36" @ \$24.15 ea \$0

Culvert total = \$0

V. STRUCTURES

Description	Type	Width	Length	Cost/ft.	Sub-total
					\$0
					\$0
					\$0

Structure total = \$0

Sub-TOTAL = \$0

VI. GENERAL EXPENSES:

Overhead & General Exp. Add 12% \$0

VII. MOBILIZATION:

Description	\$ per Move	# of Moves	Sub-total
Dump Trucks	\$100	0	\$0
Grader	\$400	0	\$0
Compactor	\$400	0	\$0
Excavator	\$450	0	\$0
Dozer D8)	\$400	0	\$0
Front end loader	\$400	0	\$0
Rock crusher	\$1,500	0	\$0
Dozer (D5)	\$240	0	\$0

* Move in costs
are averaged over
all three sheets.

Total Mobilization = \$0 Mobilization sub-total = \$0

Road No. 0
Standard: Secondary Mainline (12' R.S.)
Stations: 0.00

SHEET TOTAL = \$0

By: Colin Forsyth

Sheet 3 of 4

Date: 12/06/04

PACIFIC CASCADE REGION - ROAD COST ESTIMATE

SALE NAME: Blue Jay Thin

CONTRACT NUMBER: N/A

I. CLEARING AND GRUBBING:									
	Flat Rate -	% Side	MBF/ac	Disposal	Production	Cost/	Width	Total	Sub
		Slope		Factor	Factor	Station	Factor	Stations	Total
Road A, Road B, Spur C		20%	35	1.00	2.77	\$32	0.80	15.55	\$1,103
		30%	35	1.00	3.90	\$32	0.80	0.00	\$0
		40%	35	1.00	4.29	\$32	0.80	0.00	\$0
		50%	35	1.00	4.70	\$32	0.80	2.00	\$241

Clear and Grub TOTAL = \$1,343

II. EXCAVATION:								
	Flat Rate -	% Side	Exc. Type	Production	Cost/	Width	Total	Sub
		Slope	Fact.	Factor	Station	Factor	Stations	Total
Road A, Road B, Spur C		20%	1.00	2.00	\$66	0.50	15.55	\$0
		30%	1.00	2.50	\$66	0.50	0.00	\$0
		40%	1.00	4.56	\$66	0.50	0.00	\$301
		50%	1.00	6.85	\$66	0.50	2.00	\$452

Abandonment							
*End Haul, Over Haul, Large Fills/Cuts				Estimated	No. of Equip.		Sub
				Vol. (cy)	Days	Cost/day	Total
End Haul/ Over Haul				0	1	\$1,576	\$946
Large Fills/ Cuts				0	0	\$0	\$0

Excavation TOTAL = \$1,699

III. BALLAST AND SURFACING :					Stockpile	S-6000	
Ballast source:	17 Rd or S-6000 Pits			UNIT COSTS	Ballast	Ballast	Riprap
Surface source:				Drill & Shoot	\$0.00	\$1.50	
Riprap source :				Dig and load	\$1.00	\$1.00	
				Crushing	\$0.00	\$0.00	
				Purchase			

Description	cu.yds/sta x stations =		cubic yards
Ballast (4"-)	54	17.55	948
Surfacing (2 1/2"-)	0	17.55	0
Riprap			

* Haul Formula: (R.T.Miles/MPH+Delay)/(\$/hr / Cy/load)

R.T. Miles =	6.2						
Ave. Speed =	25	Ballast (4"-)	1301	Cu. yds @	\$4.90 /cu. yd =	\$6,375	
Delay (Hrs.)=	0.2	Surfacing (2 1/2	0	Cu. yds @	\$6.40 /cu. yd =	\$0	
Cost / Hour =	\$65.00	Riprap	0	Cu. yds @	\$2.65 /cu. yd =	\$0	
CY / Load =	11						

Rock total = \$6,375

IV. CULVERTS AND FLUMES:							
Description	Qty.	Gauge	Diameter (in.)	No/Length (ft)	Installed	Sub-total	
	1	na	18	32	Cost/ft		
					\$11.80	\$378	

Bands & Gaskets	3 - 18"@	\$9.90ea	\$10
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Culvert total = \$388

V. STRUCTURES					
Description	Type	Width	Length	Cost/ft.	Sub-total
					\$0
					\$0
					\$0

Structure total = \$0

Sub-TOTAL = \$9,804

VI. GENERAL EXPENSES:	Overhead & General Exp. Add	11%	\$1,078
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VII. MOBILIZATION:				
Description	\$ per Move	# of Moves	Sub-total	
Dump Trucks	100	0	\$0	
* Move in costs	Grader	400	0	\$0
are averaged over	Compactor	400	0	\$0
all three sheets.	Excavator	450	0	\$0
	Dozer D8)	400	0	\$0
	Front end loader	400	0	\$0
	Rock crusher	\$1,500	0	\$0
	Dozer (D5)	\$240	0	\$0

Total Mobilization = \$0 Mobilization sub-total = \$1,690

Road No.	0		
Standard:	Secondary Mainline (12' R.S.)		SHEET TOTAL = \$12,573
Stations:	2.00		